10/552552

<110> Bayer BioScience N.V.
      De Block, Marc

<120> Methods and means for increasing the tolerance of plants to stress conditions.

<130> BCS 03 2002 WO1

<150> PCT/EP04/003995
<151> 2004-04-09

<150> EP03076044.1
<151> 2003-04-09

<150> US 60/496,688
<151> 2003-08-21

<160> 25

<170> PatentIn version 3.1

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Leu Lys Ala Met Ser Glu Gly Pro Ser His Ser Gln Val Asp Ser Gly
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Ser Thr Leu Glu Pro Ser Ala Ser Asn Gly Tyr Ala Phe Leu Phe Asp
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Glu Leu Ile Asp Glu Lys Glu Ser Lys Arg Trp Phe Asp Glu Ile Ile
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Arg Cys Ile Met His Tyr Phe Glu Arg Phe Cys Ser Cys Val Pro Ile
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Gly Ile Val Ser Phe Glu Arg Lys Ile Thr Ala Ala Pro Asp Ala Asp
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Leu Lys Ala Leu Ser Glu Gly Pro His Tyr Ser Asn Val Asn Ser Gly
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Gln Val Leu Phe Leu Ala Ile Ser Asp Ile Arg Asn Ser Leu Ser Leu
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Pro Asp Ser Ser Ile Ser Ser Ser Ala Ser Asp Gly Phe Ser Leu Leu
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Phe Asp Asp Leu Ile Pro Arg Asp Glu Ala Val Lys Trp Phe Lys Glu
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Val Val Pro Lys Met Ala Asp Leu Leu Leu Arg Leu Pro Ser Leu Leu
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12

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13

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14

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15

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Xaa Gly Xaa Val Gln Glu Glu Ile Arg Phe Xaa Xaa Xaa Pro Glu
            20                  25                  30


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1               5                   10                  15


Xaa Xaa Xaa Gln
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<221>  MISC_FEATURE
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<220>
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1               5                   10


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<212>  PRT
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<220>
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<220>
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<400>  13

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1               5                   10


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1               5                   10                  15

gtg ctc cgc ggc ggc gcg ctc ttc tgg ccg ccg gcg gcg cag gag gcg      96
Val Leu Arg Gly Gly Ala Leu Phe Trp Pro Pro Ala Ala Gln Glu Ala
                20                  25                  30

ctc aag gcg ctg gcg ctg ggc ccc gac gtg agc cgc gtc tcc tcc ggc     144
Leu Lys Ala Leu Ala Leu Gly Pro Asp Val Ser Arg Val Ser Ser Gly
            35                  40                  45

gac gtc ctc gcc gac gcc ctc acc gac ctc cgc ctc gcg ctc aac ctc     192
Asp Val Leu Ala Asp Ala Leu Thr Asp Leu Arg Leu Ala Leu Asn Leu
        50              55                  60

gac cca ctc ccg cgc cgc gcc gcc gag ggc ttc gcg ctc ttc ttc gac     240
Asp Pro Leu Pro Arg Arg Ala Ala Glu Gly Phe Ala Leu Phe Phe Asp
65                  70                  75                  80

gac ctc ctg tcg cgg gcg cag gcg cgg gac tgg ttc gac cac gtc gcc     288
Asp Leu Leu Ser Arg Ala Gln Ala Arg Asp Trp Phe Asp His Val Ala
                85                  90                  95
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ccc tcc ctc gcc cgc ctc ctc ctc cgc ctc ccc acg ctg ctc gag ggc   336
Pro Ser Leu Ala Arg Leu Leu Leu Arg Leu Pro Thr Leu Leu Glu Gly
          100   105   110

cac tac cgc gcc gcc ggc gac gag gct cgc ggg ctc cgc atc ctg agc   384
His Tyr Arg Ala Ala Gly Asp Glu Ala Arg Gly Leu Arg Ile Leu Ser
          115   120   125

tcg cag gat gcc ggg ctc gtg ctc ctc agc cag gag ctc gcc gcc gcg   432
Ser Gln Asp Ala Gly Leu Val Leu Leu Ser Gln Glu Leu Ala Ala Ala
          130   135   140

ctg ctc gcc tgc gcg ctc ttc tgc ctg ttc ccc acc gcc gat agg gcc   480
Leu Leu Ala Cys Ala Leu Phe Cys Leu Phe Pro Thr Ala Asp Arg Ala
145   150   155   160

gag gcg tgc ctc ccg gcg atc aat ttc gat agc cta ttt gcg gca ctg   528
Glu Ala Cys Leu Pro Ala Ile Asn Phe Asp Ser Leu Phe Ala Ala Leu
              165   170   175

tgt tat aat tcg agg caa agc cag gag cag aag gtg agg tgc ctt gtt   576
Cys Tyr Asn Ser Arg Gln Ser Gln Glu Gln Lys Val Arg Cys Leu Val
              180   185   190

cac tat ttt gac agg gtg acc gct tct aca cct act ggt tcc gtt tcg   624
His Tyr Phe Asp Arg Val Thr Ala Ser Thr Pro Thr Gly Ser Val Ser
              195   200   205

ttt gag cgt aag gtt ctt cct cgc cgt cct gaa tct gat ggc att acg   672
Phe Glu Arg Lys Val Leu Pro Arg Arg Pro Glu Ser Asp Gly Ile Thr
          210   215   220

tac cct gac atg gat act tgg atg aaa tct ggt gtt ccc ctt tgc aca   720
Tyr Pro Asp Met Asp Thr Trp Met Lys Ser Gly Val Pro Leu Cys Thr
225   230   235   240

ttc cgg gta ttt tcc tca ggc ttg ata gaa gat gag gaa caa gaa gcc   768
Phe Arg Val Phe Ser Ser Gly Leu Ile Glu Asp Glu Glu Gln Glu Ala
              245   250   255

ctt gaa gtt gac ttt gca aat aga tat ttg gga ggt ggc gca ctt tcc   816
Leu Glu Val Asp Phe Ala Asn Arg Tyr Leu Gly Gly Gly Ala Leu Ser
              260   265   270

aga ggc tgc gtg cag gaa gaa atc cgg ttc atg ata aac cca gaa ttg   864
Arg Gly Cys Val Gln Glu Glu Ile Arg Phe Met Ile Asn Pro Glu Leu
          275   280   285

atc gtg ggc atg ctc ttc atg gtt tca atg gaa gat aat gaa gct ata   912
Ile Val Gly Met Leu Phe Met Val Ser Met Glu Asp Asn Glu Ala Ile
          290   295   300

gaa att gtt ggt gca gaa agg ttc tca cag tac atg ggg tat ggt tcc   960
Glu Ile Val Gly Ala Glu Arg Phe Ser Gln Tyr Met Gly Tyr Gly Ser
305   310   315   320

tca ttc cgt ttt act ggt gac tac tta gat agc aaa ccc ttt gat gcg   1008

20

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Ser Phe Arg Phe Thr Gly Asp Tyr Leu Asp Ser Lys Pro Phe Asp Ala
            325             330             335

atg ggt aga cgg aaa act agg ata gtg gca att gat gct ttg gac tgt        1056
Met Gly Arg Arg Lys Thr Arg Ile Val Ala Ile Asp Ala Leu Asp Cys
            340             345             350

cca act agg tta cag ttt gaa tct agt ggt ctt cta agg gaa gtg aac        1104
Pro Thr Arg Leu Gln Phe Glu Ser Ser Gly Leu Leu Arg Glu Val Asn
            355             360             365

aag gct ttt tgt gga ttt ttg gat caa tca aat cat cag ctc tgt gca        1152
Lys Ala Phe Cys Gly Phe Leu Asp Gln Ser Asn His Gln Leu Cys Ala
            370             375             380

aag ctt gtc cag gat tta aat aca aag gat aac tgt cca agt gtc att        1200
Lys Leu Val Gln Asp Leu Asn Thr Lys Asp Asn Cys Pro Ser Val Ile
385             390             395             400

cct gat gaa tgc ata gga gtt tca act gga aac tgg ggt tgc ggg gct        1248
Pro Asp Glu Cys Ile Gly Val Ser Thr Gly Asn Trp Gly Cys Gly Ala
                405             410             415

ttt ggt gga aac cct gaa atc aag agc atg att caa tgg att gct gca        1296
Phe Gly Gly Asn Pro Glu Ile Lys Ser Met Ile Gln Trp Ile Ala Ala
                420             425             430

tca cag gca ctc cga tct ttt att aac tac tac act ttt gag tcc gaa        1344
Ser Gln Ala Leu Arg Ser Phe Ile Asn Tyr Tyr Thr Phe Glu Ser Glu
            435             440             445

tca ctg aaa aga tta gaa gag gtg acc cag tgg ata ttg cgc cat agg        1392
Ser Leu Lys Arg Leu Glu Glu Val Thr Gln Trp Ile Leu Arg His Arg
            450             455             460

tgg acg gtt ggc gag ttg tgg gac atg ctt gtg gag tat tca tcc cag        1440
Trp Thr Val Gly Glu Leu Trp Asp Met Leu Val Glu Tyr Ser Ser Gln
465             470             475             480

agg cta aga gga gac acc aat gag ggc ttt tta aca tgg cta ctt ccc        1488
Arg Leu Arg Gly Asp Thr Asn Glu Gly Phe Leu Thr Trp Leu Leu Pro
                485             490             495

aag gac atc ccc aat ggt gat gta gat tac atg tgt gaa tag              1530
Lys Asp Ile Pro Asn Gly Asp Val Asp Tyr Met Cys Glu
                500             505


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<212>   PRT
<213>   Oryza sativa

<400>   16

Met Glu Ala Arg Gly Asp Leu Arg Ser Ile Leu Pro Tyr Leu Pro Val
1               5               10              15
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21

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            20                  25                  30


Leu Lys Ala Leu Ala Leu Gly Pro Asp Val Ser Arg Val Ser Ser Gly
            35                  40                  45


Asp Val Leu Ala Asp Ala Leu Thr Asp Leu Arg Leu Ala Leu Asn Leu
            50                  55                  60


Asp Pro Leu Pro Arg Arg Ala Ala Glu Gly Phe Ala Leu Phe Phe Asp
65                  70                  75                  80


Asp Leu Leu Ser Arg Ala Gln Ala Arg Asp Trp Phe Asp His Val Ala
                85                  90                  95


Pro Ser Leu Ala Arg Leu Leu Leu Arg Leu Pro Thr Leu Leu Glu Gly
                100                 105                 110


His Tyr Arg Ala Ala Gly Asp Glu Ala Arg Gly Leu Arg Ile Leu Ser
                115                 120                 125


Ser Gln Asp Ala Gly Leu Val Leu Leu Ser Gln Glu Leu Ala Ala Ala
        130                 135                 140


Leu Leu Ala Cys Ala Leu Phe Cys Leu Phe Pro Thr Ala Asp Arg Ala
145                 150                 155                 160


Glu Ala Cys Leu Pro Ala Ile Asn Phe Asp Ser Leu Phe Ala Ala Leu
                165                 170                 175


Cys Tyr Asn Ser Arg Gln Ser Gln Glu Gln Lys Val Arg Cys Leu Val
                180                 185                 190


His Tyr Phe Asp Arg Val Thr Ala Ser Thr Pro Thr Gly Ser Val Ser
        195                 200                 205


Phe Glu Arg Lys Val Leu Pro Arg Arg Pro Glu Ser Asp Gly Ile Thr
        210                 215                 220


Tyr Pro Asp Met Asp Thr Trp Met Lys Ser Gly Val Pro Leu Cys Thr
225                 230                 235                 240
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22

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Phe Arg Val Phe Ser Ser Gly Leu Ile Glu Asp Glu Glu Gln Glu Ala
            245                 250             255


Leu Glu Val Asp Phe Ala Asn Arg Tyr Leu Gly Gly Gly Ala Leu Ser
            260                 265             270


Arg Gly Cys Val Gln Glu Glu Ile Arg Phe Met Ile Asn Pro Glu Leu
            275             280             285


Ile Val Gly Met Leu Phe Met Val Ser Met Glu Asp Asn Glu Ala Ile
    290             295             300


Glu Ile Val Gly Ala Glu Arg Phe Ser Gln Tyr Met Gly Tyr Gly Ser
305             310             315             320


Ser Phe Arg Phe Thr Gly Asp Tyr Leu Asp Ser Lys Pro Phe Asp Ala
            325             330             335


Met Gly Arg Arg Lys Thr Arg Ile Val Ala Ile Asp Ala Leu Asp Cys
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Pro Thr Arg Leu Gln Phe Glu Ser Ser Gly Leu Leu Arg Glu Val Asn
            355             360             365


Lys Ala Phe Cys Gly Phe Leu Asp Gln Ser Asn His Gln Leu Cys Ala
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Lys Leu Val Gln Asp Leu Asn Thr Lys Asp Asn Cys Pro Ser Val Ile
385             390             395             400


Pro Asp Glu Cys Ile Gly Val Ser Thr Gly Asn Trp Gly Cys Gly Ala
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Phe Gly Gly Asn Pro Glu Ile Lys Ser Met Ile Gln Trp Ile Ala Ala
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Ser Gln Ala Leu Arg Ser Phe Ile Asn Tyr Tyr Thr Phe Glu Ser Glu
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Ser Leu Lys Arg Leu Glu Glu Val Thr Gln Trp Ile Leu Arg His Arg
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gtcgggcggt cgatgccgac aacggttagc ggttgatctt cccgcacggc cgcccaatcg   9840

cgggcactgc cctggggatc ggaatcgact aacagaacat cggccccggc gagttgcagg   9900

gcgcgggcta gatgggttgc gatggtcgtc ttgcctgacc cgcctttctg gttaagtaca   9960

gcgataacct tcatgcgttc cccttgcgta tttgtttatt tactcatcgc atcatatacg   10020
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41

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cagcgaccgc atgacgcaag ctgtttact  caaatacaca tcacctttt  agacggcggc   10080

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cggccaggat ttcatgcagc cgcacggttg agacgtgcgc gggcggctcg aacacgtacc   10200

cggccgcgat catctccgcc tcgatctctt cggtaatgaa aaacggttcg tcctggccgt   10260

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ttcgccagcc aggacagaaa tgcctcgact tcgctgctgc ccaaggttgc cgggtgacgc   11580

acaccgtgga aacggatgaa ggcacgaacc cagtggacat aagcctgttc ggttcgtaag   11640

ctgtaatgca agtagcgtat gcgctcacgc aactggtcca gaaccttgac cgaacgcagc   11700

ggtggtaacg cgcagtggc  ggttttcatg gcttgttatg actgttttt  tggggtacag   11760
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42

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tctatgcctc gggcatccaa gcagcaagcg cgttacgccg tgggtcgatg tttgatgtta  11820

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cgccatctcg aaccgacgtt gctggccgta catttgtacg gctccgcagt ggatggcggc  12000

ctgaagccac acagtgatat tgatttgctg gttacggtga ccgtaaggct tgatgaaaca  12060

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attctccgcg ctgtagaagt caccattgtt gtgcacgacg acatcattcc gtggcgttat  12180

ccagctaagc gcgaactgca atttggagaa tggcagcgca atgacattct tgcaggtatc  12240

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agcgttgcct tggtaggtcc agcggcggag gaactctttg atccggttcc tgaacaggat  12360

ctatttgagg cgctaaatga aaccttaacg ctatggaact cgccgcccga ctgggctggc  12420

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cgcgcagatc agttggaaga atttgtccac tacgtgaaag gcgagatcac caaggtagtc  12660

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atgtggatca ctccgttgcc ccgtcgctca ccgtgttggg gggaaggtgc acatggctca  13140

gttctcaatg gaaattatct gcctaaccgg ctcagttctg cgtagaaacc aacatgcaag  13200

ctccaccggg tgcaaagcgg cagcgg                                       13226
```